CLAIMS

What is claimed is:

1. A diagnostic system for a brake booster sensor, comprising:

a monitor that monitors a maximum error and a minimum error based on a brake booster sensor signal over a monitoring period; and

a first comparator that determines one of a pass status and a fail status of said brake booster sensor based on said maximum error and said minimum error.

2. The diagnostic system of claim 1 further comprising an error reduction fraction (ERF) calculator that determines an ERF based on said maximum error and said minimum error.

3. The diagnostic system of claim 2 wherein said first comparator compares said ERF to a threshold to determine one of said pass status and said fail status.

4. The diagnostic system of claim 3 wherein if said ERF is less than said threshold, said first comparator generates a fail status signal.

5. The diagnostic system of claim 3 wherein if said ERF is equal to said threshold, said first comparator generates a pass status signal.

6. The diagnostic system of claim 1 further comprising a second comparator that generates a first diagnostic enable signal based on an engine vacuum and a brake booster vacuum.

7. The diagnostic system of claim 6 wherein said second comparator generates said first diagnostic enable signal if said brake booster vacuum is less than said engine vacuum.

8. The diagnostic system of claim 6 further comprising a third comparator that generates a second diagnostic enable signal based on a throttle position and a throttle position minimum.

9. The diagnostic system of claim 8 wherein said third comparator generates said second diagnostic enable signal when said throttle position is less than said throttle position minimum.

10. The diagnostic system of claim 8 wherein said monitor ceases monitoring of said maximum error and said minimum error if said third comparator ceases to generate said second diagnostic enable signal during said monitoring period.

11. A method of evaluating operation of a brake booster sensor of a vehicle brake booster, comprising:

determining whether an engine vacuum is greater than a brake booster vacuum;

monitoring an error reduction fraction if said engine vacuum is greater than said brake booster vacuum;

indicating a pass status for said brake booster sensor if said error reduction fraction achieves a predetermined level; and

indicating a fail status for said brake booster sensor if said error reduction fraction is below said predetermined level.

12. The method of claim 11 further comprising determining a throttle position, wherein said monitoring occurs when said throttle position is within a predetermined range of 0%.

13. The method of claim 11 further comprising:

determining an intake manifold absolute pressure (MAP); and

determining a throttle position, wherein said engine vacuum is based on said MAP and said throttle position.

14. The method of claim 11 further comprising calculating said error reduction fraction based on a maximum difference between said engine vacuum and said brake booster vacuum and a minimum difference between said engine vacuum and said brake booster vacuum within a predetermined time.

15. The method of claim 11 further comprising enabling fluid flow to an engine from said brake booster when said engine vacuum is greater than said brake booster vacuum.

16. A vehicle having a sensor diagnostic system, comprising:

a displacement on demand (DOD) engine having an intake manifold and a plurality of cylinders;

a brake booster that is in selective communication with said intake manifold; and

a controller that determines whether an engine vacuum is greater than a brake booster vacuum, that monitors an error reduction fraction if said engine vacuum is greater than said brake booster vacuum, that indicates a pass status for a brake booster sensor if said error reduction fraction achieves a predetermined level and that indicates a fail status for said brake booster sensor if said error reduction fraction is below said predetermined level.

17. The vehicle of claim 16 wherein said error reduction fraction is determined over a minimum time and is based on a maximum difference between said engine vacuum and said brake booster vacuum and a minimum difference between said engine vacuum and said brake booster vacuum within said minimum time.

18. The vehicle of claim 16 further comprising:

a manifold absolute pressure (MAP) sensor that generates a MAP signal for said intake manifold;

a throttle that regulates air flow into said intake manifold; and

a throttle position sensor that generates a throttle position signal.

19. The vehicle of claim 18 wherein said engine vacuum is based on said MAP signal and said throttle position signal.

20. The vehicle of claim 16 further comprising:

a conduit that interconnects said intake manifold and said brake booster; and

a check valve that selectively enables fluid communication between said intake manifold and said brake booster.

21. The vehicle of claim 20 wherein said valve enables fluid communication between said intake manifold and said brake booster when said engine vacuum is greater than said brake booster vacuum.

22. The vehicle of claim 16 further comprising:

a throttle that regulates air flow into said intake manifold; and

wherein said controller monitors said error reduction fraction when said throttle is within a predetermined range of a closed state.

23. The vehicle of claim 22 further comprising a throttle position sensor that generates a throttle position signal, wherein said predetermined range of said closed state is determined based on said throttle position signal.

24. The vehicle of claim 16 wherein said DOD engine is operable in a first mode having all of said plurality of cylinders activated and a second mode having a portion of said plurality of cylinders activated.

25. The vehicle of claim 24 wherein said DOD engine switches from said second mode to said first mode when said engine vacuum is greater than said brake booster vacuum.